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PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 090/97	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/ IT 97/ 00130	International filing date (day/month/year) 10/06/1997	(Earliest) Priority Date (day/month/year) 19/07/1996
Applicant VALENTE Gabriele et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (see Box I).
2. ☒ Unity of invention is lacking (see Box II).
3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing
 - ☐ filed with the international application.
 - ☐ furnished by the applicant separately from the international application,
 - ☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.
 - ☐ Transcribed by this Authority
4. With regard to the title, ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:
5. With regard to the abstract,
 - ☒ the text is approved as submitted by the applicant.
 - ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this International Search Report, submit comments to this Authority.
6. The figure of the drawings to be published with the abstract is:
 Figure No. ---
 - ☐ as suggested by the applicant. ☐ None of the figures.
 - ☐ because the applicant failed to suggest a figure.
 - ☐ because this figure better characterizes the invention.

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

United States Patent and Trademark
Office
(Box PCT)
Crystal Plaza 2
Washington, DC 20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 04 March 1998 (04.03.98)	
International application No. PCT/IT97/00130	Applicant's or agent's file reference 090/97
International filing date (day/month/year) 10 June 1997 (10.06.97)	Priority date (day/month/year) 19 July 1996 (19.07.96)
Applicant VALENTE, Gabriele et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
16 February 1998 (16.02.98)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Marie-José Devillard

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

COMMUNICATION OF
INTERNATIONAL APPLICATIONS

(PCT Article 20)

From the INTERNATIONAL BUREAU

To:

United States Patent and Trademark
Office
(Box PCT)
Crystal Plaza 2
Washington, DC 20231
ETATS-UNIS D'AMERIQUE

Date of mailing:

20 March 1998 (20.03.98)

in its capacity as designated Office

The International Bureau transmits herewith copies of the international applications having the following international application numbers and international publication numbers:

International application no.:

PCT/IT97/00130

International publication no.:

WO98/03333

**CORRECTED VERSION
VERSION CORRIGEE**The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer:

J. Zahra

Telephone No.: (41-22) 338.83.38

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IT 97/00130

B x I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

B x II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please see enclosed sheet for more information!

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☒ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims : 1-10(partially) A method and product characterised in that the supporting material is selected from (i) cellulosic material, (ii) a rolled section in paper treated with solution, (iii) a rolled section in melaminic paper.

A method and product characterised in that the supporting material is selected from synthetic or natural rubber, whereby once again this definition is rather vague; having regard to the examples it is assumed that foamed materials are meant, (i) foam made of reticulated polyethylene with closed cells, (ii) foamed polyurethane, (iii) foamed polyethylene, (iv) foamed polystyrene.

2. Claims : 1-10(partially) A method and product characterised in that the supporting material is selected from (i) a mixture of leather regenerated materials or derivatives thereof, (ii) natural or synthetic leather.

3. Claims : 1-10(partially) A method and product characterised in that the supporting material is selected from a cardboard or cardboard fibre.

4. Claims : 1-10(partially) A method and product characterised in that the supporting material is selected from (i) needled fabrics, (ii) nonwoven fabric, neoprene, masonite, recycled polyethylene, nylon, Lilon (TM), Tyvec (TM), polyester or a net made of synthetic material, whereby it is noted that the definition of these supporting materials is not quite clear and that it is assumed that nonwoven fibrous materials are meant, (iii) a felt.

5. Claims : 1-10(partially) A method and product characterised in that the supporting material is selected from cork or wood,

6. Claims : 1-10(partially) A method and product characterised in that the supporting material is a coagulated material.

7. Claims : 1-10(partially) A method and product characterised in that the supporting material is a perspiring material.

8. Claims : 1-10(partially) A method and product characterised in that the supporting material is an agglomerated stone-like material.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 97/00130

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 B32B27/08 D06N3/00 A43B1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B32B D06N A43B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 514 224 A (ROHM & HAAS) 14 June 1978 see page 1, line 12 - line 40 see page 5, line 86 - page 6, line 11; claims 1,2,6,12-14 ---	1,6,9,10
X	DE 32 20 768 A (PELZ ERNST) 8 December 1983 see page 3, line 1 - page 4, line 9 see page 6, paragraph 2 see page 7, paragraph 5 see page 11, paragraph 6 see claims 1-4,6,7 ---	1,6,7,9,10
X	DE 16 54 451 A (KÖBA-AUSRÜSTUNGS-GMBH) 1 April 1971 see the whole document --- -/--	1,6,9,10



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

14 January 1998

Date of mailing of the international search report

05.02.98

Name and mailing address of the ISA

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NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

De Jonge, S

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/IT 97/00130

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 536 421 A (ICI LTD) 20 December 1978 see page 2, line 20 - line 43; claims ---	1,6,9,10
X	FR 2 388 659 A (BASF AG) 24 November 1978 see page 2, line 38 - page 3, line 6; claims ---	1,4,6,9, 10
X	US 3 849 174 A (ANCKER F) 19 November 1974 see column 9, line 7 - line 16; figures; example 1 ---	1,6,9
X	GB 1 466 030 A (FUJI PHOTO FILM CO LTD) 2 March 1977 see claims 1-8; example 1 ---	1,6,9
X	US 3 799 827 A (TAKIMOTO M ET AL) 26 March 1974 see column 2, line 22 - column 3, line 68; claims; figures ---	1,6,9
A	FR 2 379 387 A (FORMICA SA) 1 September 1978 see claims; example 3 ---	1,6,9
A	DR. H.D. JUNG: "Index of Polymer Trade Names 2nd, greatly enlarged edition" 1992, VCH VERLAGSGESELLSCHAFT MBH, WEINHEIM XP002040912 see page 550 - page 551 ---	
X	DE 22 26 645 A (TENNECO, CHEMICALS, INC., NEW YORK, N.Y.) 14 December 1972 see page 9, line 9 - line 12; claims 1,6,10 ---	1,6,9
X	FR 2 700 497 A (SILAC) 22 July 1994 see claims 1,2,7 ---	1,6,9
P,X	WO 96 27497 A (NABINGER UDO) 12 September 1996 see page 12, paragraph 3; claims 1,3 ---	1,6,9,10
X	FR 2 227 125 A (YHTYNEET PAPERITEHTAAT OY) 22 November 1974 see page 3, line 5 - page 4, line 40 see page 5, line 25 - line 34; claims 1,2,5; figure 4 ---	1,6,7,9
X	EP 0 374 930 A (GOYO PAPER WORKING CO LTD) 27 June 1990 see column 4, line 13 - line 24 see column 6, line 15 - line 20 see claims 1,4,6 ---	1,9
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 97/00130

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 804 700 A (HOEY C) 16 April 1974 see column 4, line 18 - line 28 see column 5, line 7 - line 51; claims ---	1,6,9
X	GB 1 549 421 A (SCOTT PAPER CO) 8 August 1979 see claims; figures ---	1,9
A	US 3 892 078 A (CLOSSON JR ADDISON W) 1 July 1975 see claims; figures ---	1,9,10
A	EP 0 163 045 A (INDENTOR AG) 4 December 1985 see claims ---	1,9,10
A	DE 84 31 869 U (INDENTOR AG, BUCHS, CH) 27 February 1986 see claims; figure ---	1,9,10
A	GB 1 481 876 A (MINNESOTA MINING & MFG) 3 August 1977 see claims; figures -----	1,9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IT 97/00130

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1514224 A	14-06-78	CS 187323 B DE 2528947 A JP 999700 C JP 51006286 A JP 54034043 B	31-01-79 22-01-76 30-05-80 19-01-76 24-10-79
DE 3220768 A	08-12-83	NONE	
DE 1654451 A	01-04-71	NONE	
GB 1536421 A	20-12-78	BE 837090 A DE 2558920 A FR 2297136 A JP 51092357 A NL 7600006 A	16-04-76 08-07-76 06-08-76 13-08-76 09-07-76
FR 2388659 A	24-11-78	DE 2721532 A BE 866294 A	09-11-78 24-10-78
US 3849174 A	19-11-74	AU 472670 B AU 5235173 A BE 795862 A CA 1013624 A DE 2309059 A FR 2173257 A GB 1426077 A JP 872175 C JP 48099258 A JP 52001750 B US 3874833 A BE 752972 A CH 527683 A DE 2065797 A DE 2033156 A FR 2054186 A GB 1322535 A US 3658978 A US 3765817 A	03-06-76 22-08-74 23-08-73 12-07-77 30-08-73 05-10-73 25-02-76 20-07-77 15-12-73 18-01-77 01-04-75 04-01-71 15-09-72 05-02-76 21-01-71 16-04-71 04-07-73 25-04-72 16-10-73
GB 1466030 A	02-03-77	JP 51003222 A	12-01-76

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IT 97/00130

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3799827 A	26-03-74	NONE	
FR 2379387 A	01-09-78	NONE	
DE 2226645 A	14-12-72	BE 784288 A	02-10-72
		FR 2140155 A	12-01-73
		NL 7207251 A	05-12-72
		US 3741844 A	26-06-73
		ZA 7203152 A	28-02-73
FR 2700497 A	22-07-94	NONE	
WO 9627497 A	12-09-96	DE 19508158 A	12-09-96
		AU 5102796 A	23-09-96
		EP 0813474 A	29-12-97
FR 2227125 A	22-11-74	CH 575508 A	14-05-76
		DE 2419324 A	07-11-74
		SE 435850 B	22-10-84
EP 0374930 A	27-06-90	JP 2269098 A	02-11-90
		JP 2167746 A	28-06-90
		JP 7002414 B	18-01-95
		AU 640630 B	02-09-93
		AU 4992590 A	11-10-90
		CA 2006007 A	21-06-90
		US 5188395 A	23-02-93
		CN 1044068 A	25-07-90
US 3804700 A	16-04-74	US RE28682 E	13-01-76
GB 1549421 A	08-08-79	AU 1291976 A	20-10-77
		BE 840550 A	11-10-76
		DE 2616067 A	28-10-76
		FR 2306831 A	05-11-76
		JP 51133378 A	19-11-76
		NL 7603824 A	12-10-76
		SE 7604243 A	11-10-76
US 3892078 A	01-07-75	DE 2341747 A	07-03-74

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IT 97/00130

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3892078 A		JP 49124185 A	27-11-74
EP 0163045 A	04-12-85	DE 3420121 A	05-12-85
		DE 3422783 A	02-01-86
		DE 3431474 A	06-03-86
		DE 3439727 A	30-04-86
		CA 1267352 A	03-04-90
		EP 0163133 A	04-12-85
		JP 61008048 A	14-01-86
		US 4887368 A	19-12-89
DE 8431869 U	27-02-86	NONE	
GB 1481876 A	03-08-77	US 3895153 A	15-07-75
		AU 467758 B	11-12-75
		AU 7402274 A	11-12-75
		DE 2447989 A	24-04-75
		JP 869353 C	13-07-77
		JP 50065536 A	03-06-75
		JP 51044010 B	26-11-76

PATENT COOPERATION TREATY

30 OCT 1998


PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 090/97	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (PCT/IPEA/416)
International application No. PCT/IT97/00130	International filing date (day/month/year) 10/06/1997	Priority date (day/month/year) 19/07/1996	
International Patent Classification (IPC) or national classification and IPC B32B27/08			
Applicant VALENTE, Gabriele et al.			

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 10 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 8 sheets.</p>
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input checked="" type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input checked="" type="checkbox"/> Certain documents cited VII <input checked="" type="checkbox"/> Certain defects in the international application VIII <input checked="" type="checkbox"/> Certain observations on the international application

Date of submission of the demand 16/02/1998	Date of completion of this report 28. 10. 98
Name and mailing address of the IPEA/  European Patent Office D-80298 Munich Tel. (+49-89) 2399-0. Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer Coquelin, J Telephone No. (+49-89) 2399-8495



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IT97/00130

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-6 as received on 13/10/1998 with letter of 10/10/1998

Claims, No.:

1-4 as received on 13/10/1998 with letter of 10/10/1998

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IT97/00130

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

☐ complied with.

☒ not complied with for the following reasons:

see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

☒ all parts.

☐ the parts relating to claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-4
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-4
Industrial applicability (IA)	Yes:	Claims	1-4
	No:	Claims	

2. Citations and explanations

see separate sheet

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

s e separat sh et

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IT97/00130

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IT97/00130

Item IV, Non-unity

1. The claimed composite material of claims 1-3 and the use thereof (claim 4) in fact pertain, given the established prior art, to a multiplicity of inventions which would justify an invitation to restrict the claims or pay additional examination fees. This International Provisional Examination Authority however refrains from issuing such an invitation and will establish the present report for the application as a whole, based on the application documents filed with the applicant's letter dated 10.10.98.
2. The subject matter of present claim 1 is plural and claim 1 encompasses numerous composites which have the following features in common:
 - i) they comprise a supporting material (a wide variety of **substrates**),
 - ii) which supporting material is in the form of sheet or roll and
 - iii) is provided with a covering surface layer made of polyethylene or Surlyn,
 - iv) the covering layer is embossed, and
 - v) the resulting composite is said to have (ought to have) a high surface resistance and be non-toxic and
 - vi) at most, it may be implicit that the composites are (should be) suitable for at least one of the uses listed in claim 4.
3. Composites exhibiting the above noted features i) to iv) have been known from a number of prior art documents, each taken separately.

These known composites having a covering surface layer made of polyethylene or Surlyn will correspondingly have a high surface resistance and be non-toxic, hence satisfy the criteria expressed as feature v). At least some of them will be suitable for at least one of the uses listed as feature vi).

It follows that features i)-vi) do not define a "common inventive concept" within the meaning of the PCT and that the present application (claim 1) concerns a plurality of distinct inventions each further characterised only by the nature of the supporting material constitutive element of the claimed composites. The different supporting materials (hence, the different inventions) listed in present claim 1 are the following:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IT97/00130

- a) cellulosic material;
 - b) a mixture of leather regenerated materials or derivatives thereof; natural leather;
 - c) cork or wood;
 - d) a coagulated material;
 - e) felt; and, finally
 - f) a perspiring material.
-

The prior art relevant for the present assessment of unity is identified and analysed with more detail under Item V herein after.

The present claim 2 is dependent on claim 1 and adds a further feature which per se cannot restore unity. Indeed, the process feature: "said supporting material is spread with a leather-like scent prior to the embossing operation" cannot as such distinguish between composites including leather or regenerated leather, as identified under b) above, and such supporting leather materials which have been spread with a leather-like scent. Only those materials recited under a) and c)-f) above will form unity thanks to the additional feature of claim 2, so far providing the latter may be regarded as involving an inventive step. The limitation of claim 3 dependent on claim 1 also fails to restore unity, because corresponding subject matter was also known from a single prior art document (see Item V). Claim 4 also fails to define subject matter having unity within the meaning of the PCT.

Item V, Patentability

1. The documents revealed by the International Search Report (ISR) will be referred to as D1, D2, ... and D21 in the numerical order of their appearance in the ISR.
2. The subject matter of present claims 1-4 lacks novelty.
 - 2.1 The present wording of claim 1 does not expressly exclude the presence of an intermediate layer, e.g. a layer of adhesive or a layer of a foam or crushed foam material (see Item VIII herein after). In the following, those documents cited in the ISR which clearly require a (crushed) foam material have been discarded. A number of documents remain however, the teaching of which deprives the subject

matter of claims 1-4 of novelty.

- 2.2 D6 pertains to some kind of coextrusion-calendering whereby a laminating web, e.g. **paper** stock (a **cellulose** material), is sandwiched between two layers of flowable plastic material, e.g. low density polyethylene, see example 1. Calendering may be so arranged as to produce an embossed laminate, see example 2. Other suitable laminating materials are **cotton** cloth (cellulose) or **felt**. The embossed laminate is e.g. suitable for automotive upholstery (furnishing elements). This is regarded to deprive the subject matter of claims 1 and 4 of novelty.
- 2.3 D7 describes extrusion coating both sides of **paper** sheet material, using polyethylene. The product passes through an embossing calender (see example 1 and claim 1). This affects the novelty of claim 1.
- 2.4 D13 is no pre-published document. It seems however to deprive the subject matter of claims 1 and 4 of novelty (see Item VI herein after).
- 2.5 D14 teaches a laminating process whereby a sheet of **paper**, woven or non woven material (see page 5, line 29) is provided with a layer of polyolefin, e.g. polyethylene. This layer is provided with recesses/perforations. Thus, the product is at the same time "embossed" and perforated. This affects the novelty of claims 1 and 3.
- 2.6 D15 again describes composite materials having an embossed coating of polyethylene or ethylene copolymer on a basis layer of e.g. **paper** or non-woven fabric. Obviously, this composite material is suitable for at least one of the broadly indicated uses of claim 4. Claim 1 thus lacks novelty.
3. So far it is novel, the subject matter of claims 1-4 lacks inventive step.
- 3.1 It would have been obvious for a skilled person to apply the extrusion calendering conditions of D6, example 2 to produce a composite of example 1 (paper coated with polyethylene) having an embossed surface, e.g. imitating leather, especially as the product of example 2 is suitable for use in automotive upholstery.

- 3.2 D11 refers on page 12 to known extrusion processes whereby a carrier which is a metal foil, a plastic material, a foam, paper, cellophane or leather is coated with an ethylene/ acrylic acid copolymer (Surlyn is believed to be such a copolymer). Although D11 teaches the manufacture of an embossed composite having a foam core, the whole technical information therein makes the production of a polyethylene coated leather having an embossed surface obvious. This deprives claims 1, and 2 of inventive step.
- 3.3 D12 provides a non woven supporting material with a superficial layer, e.g. of polyethylene. The composite is calendered to provide it with an embossed surface (see page 5, bottom). The product is useful as a lining material for automotive purpose (furnishing material). Teaching the use of a needled non woven as the supporting material is considered to render the use of an otherwise indeterminate felt obvious. This makes the subject matter of claims 1 and 4 lack inventive step.
- 3.4 Similarly, D14 already analysed under 2.5 makes use of a non woven fabric which is considered to make "felt" obvious. Since the covering layer will have perforations, the alternative "felt" in claims 1, 3 and 4 lacks inventive step.

Item VI, Certain documents cited

D13 = WO-A-96/27497 was filed on 07.03.96, claiming a priority dated 08.03.95. It was published on 12.09.96, i.e. between the respective priority and filing dates of the present application and numerous States are designated in common with those of the present application.

Item VII, Certain defects

1. The present application does not properly acknowledge the prior art as known from the documents referred to in present Item V.
2. Claim 4, page 8, lines 5ff apparently are meant to read: "...for producing footwear soles, heels, vamps or toes; suitcase elements, spectacle cases, briefcases; chair or sofa elements or structures; furniture or furnishing elements.

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3. Page 1, line 21 probably is intended to read: "regenerated"; page 2, line 5: "handbags"; page 2, line 16: "polyester"; page 3, line 1: "chair components or structures".
4. Page 3, line 10: "claim 4 is directed to the use"; page 3, line 29: "... obtained by means of a cold-working method, for instance..."; page 4, lines 1-2: "obtained by means of a hot-working method"; page 5, line 2: "... cork soles having a paint surface...".
5. Page 5, lines 9 and 15, read: "...of ashlar and concavities." and: " suitcases, briefcases, spectacle-cases, as well as..."

Item VIII, Certain observations, especially in connection with clarity

1. As to the claims
 - 1.1 Claims 1 and 4 comprise a number of tradenames, which is objectionable as it offends clarity. Indeed, tradenames often designate substances or materials the composition or structure of which may vary with time and/or with the country where they are commercialised. A skilled person will not necessarily know what substances or materials are actually meant. No accurate definitions in terms of chemical structure or composition are given.
 - 1.2 Claims 1 and 4 further contain information which apparently is only illustrative, not limitative, being introduced as it is by the expressions: "e.g." or "such as". The corresponding features do not belong to the definition of the claims.
 - 1.3 Claims 1 and 4 further lack clarity, because the "derivatives" of leather regenerated materials can be anything and because a "coagulated material" can be anything.
 - 1.4 Claim 1 does not make it fully clear whether the covering layer should or not be in direct contact with the supporting material layer. An intermediate layer of e.g. an adhesive material, a foam or a crushed foam layer may possibly be included, as is apparently allowed by the wording "comprising". The above assessment of novelty

and inventive step was made as if the claims excluded any such intermediate.

- 1.5 It is noted that the expression "perspiring material" in claim 1 covers "felt"; this overlap between two alternatives within claim 1 renders the claim obscure.

2. As to the description

- 2.1 Page 2, lines 30-31 refer to a "high" surface resistance, something which is almost meaningless without any reference to the mechanical or physical property actually encompassed and without any reference to a method of testing said property or properties.

- 2.2 It may be an aim of the present invention to provide a material which is non-toxic, as polyethylene and "Surlyn" possibly are. However, if non-toxicity results from the barrier properties of polyethylene or "Surlyn" (barrier with respect to what?), it will not be ensured in those cases where the claimed composite is "perforated" or "micro-perforated". It is thus unclear whether non-toxicity may be regarded as an advantageous effect achieved thanks to the method of the invention. In this respect, it is contended that not "any polyethylene" and possibly also "not any Surlyn" will necessarily confer the desired "surface resistance" and/or "non-toxicity": the invention apparently is not defined with sufficient detail for a skilled person to reproduce it **and** achieve the desired technical effects.

- 2.3 "Surlyn" is a commercial designation which, according to D10, covers quite different materials. Whether all these may be used as a constitutive element of the claimed composite is not clear. The word "Surlyn" alone is a generic designation covering lots of ethylene copolymers. Whether all these may be used as a constructive element of the composite material and lead to a final product endowed with the desired properties is not clear.

"COMPOSITE MATERIAL AND USE THEREOF"

5

TECHNICAL FIELD

The present invention relates to a composite material which is particularly suitable for being used in footwear manufacturing, specifically for cork soles and/or vamps and/or toes production, as well as for other applications such as spectacle-cases or the like, panellings, suitcases or leather-goods, or chairs or sofas components.

The invention is mainly applied in the fields of footwear industry or in the manufacturing of natural leather or hides, as well as in the manufacturing of furnishing elements.

BACKGROUND ART

Footwear cork soles are usually obtained from sheet or roll supporting materials, which are generally constituted by cellulosic material or regenerated leather.

Said material represents the cork sole support, and a mixture of resins together with a suitable dyestuff is sprayed or spreaded on one side of said material in a suitable industrial plant.

Thereafter, if necessary, the treated surface of the supporting sheets undergoes an embossing operation; finally, said surface is then treated with a paint layer, usually a nitro paint.

Said manufacturing method, as well as the material obtained therewith, involve some disadvantages and drawbacks, among which a low surface resistance of the treated layer, and relatively high production costs can be

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principally mentioned.

Document GB-A-1,514,224 deals with multilayer composites which simulate leather and are used in all areas where real leather is generally used, such as upholstery, apparel, hanbags, luggage and footwear.

Said multilayer composites are constituted by three essential components: a) textile fabrics which act as supporting substrates; b) crushed foam; c) a surface finish film.

Document DE-A-3,220,768 deals with a process for coupling a TNT substrate to a PVC or PU or PE layer, said TNT substrate being drenched with a polyester resin.

Document DE-A-1,654,451 deals with a process for the production of artificial or simulated leather obtained by coupling a foamed polyurethane to a synthetic layer, e.g. PVC, PE, PP, PA, polyester.

Document GB-A-1,536,421 deals with flexible laminates comprising a first outer layer made of a thermoplastic material: a first backing layer for the first outer layer which is constituted by paper or thin cardboard or woven and non-woven cloth; a second outer layer made of a polymeric material and the backing layer of said second outer layer which is, for example, cardboard, or woven or non-woven textile material.

Document FR-A-2,388,659 deals with the application of a coating made of synthetic resin to a PE foam.

DESCRIPTION OF THE INVENTION

The present invention aims to give a simple and economic solution to the above-mentioned problems and, thus, to provide for a composite material provided with a high surface resistance, thus being particularly suitable for a plurality of applications, such as footwear cork soles or toes, and also parts of suitcases, brief-cases, spectacle-

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cases, chairs components or structures, etc., as well as for recycling and regenerating stocks of leather materials, said composite material being non-toxic and thus usable for contacting the skin also for a long period of time.

5 This is obtained by means of the features disclosed in the main claim.

 The dependent claims outline particularly advantageous forms of embodiment of the composite material according to the invention.

10 Furthermore, claim 4 discloses the use of said composite material.

 According to the present invention, the composite material is constituted by a suitable supporting material, available in sheets or rolls, to which a polyethylene or
15 Surlyn® covering layer is applied, said covering layer being advantageously constituted by a thin film.

 Said supporting material is constituted by a material selected from the group comprising:

- cellulosic material in sheets or rolls (for instance
20 Bontex® or Texon®);
- a mixture of leather regenerated materials or derivatives thereof (for instance Salpa);
- natural leather even from stock;
- cork or wood;
- 25 - coagulated materials;
- felt;
- a perspiring material such as Goretex® or Simpatex®.

 The coupling of the supporting material with the covering layer can be obtained with a cold-working, for
30 instance interposing a suitable double adhesive film between the supporting material and the film made of polyethylene or Surlyn®, or by means of a sprayed or spread adhesive;

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alternatively, the coupling of the film can be obtained with a hot-working.

Furthermore, the composite material, which is obtained by coupling the polyethylene or Surlyn® covering layer with the supporting material, is embossed during the coupling operation.

The embossed composite material according to the present invention is non-toxic and presents extraordinary mechanical properties, for instance a very high surface resistance to abrasion or scraping.

Furthermore, according to a form of embodiment, a wool layer or a net is placed over the covering layer.

Besides, a dyestuff layer (physical or sublimatic) can be interposed between the supporting material and the transparent polyethylene or Surlyn® covering layer.

Following to the coupling operation, the resultant composite material may immediately be cut so as to obtain the desired shapes, for instance cork soles or other footwear elements (heels or toes), or wall-paper sheets, suitcase elements, furniture articles, etc.

In this context, it is useful to remark that the composite material according to the invention includes a polyethylene surface layer, which makes it non-toxic and it may freely be used in any applications which come into contact with the human skin, which operation is not possible, for instance, with known composite materials having surface layers made of polyvinylchloride PVC.

As mentioned above, the composite material according to the present invention has a very high surface resistance and can be used in many applications, above all in the footwear field.

In fact, tests demonstrated that this material is particularly suitable for manufacturing cork soles, which

show higher mechanical resistance than those which are typical of the known cork soles, having a paint surface layer; other interesting applications are those concerning the manufacturing of heels or toes or vamps.

5 In this context it is appropriate to note that, in the case where the supporting material is a leather, the application of the polyethylene surface layer gives stability to the supporting material surface, thereby preventing the formation of ashlars, concavities, etc.

10 According to a further form of embodiment of the invention, the supporting material can be sprayed with a leather-like scent prior to embossing. In this case the resulting material cannot be distinguished from real leather any more.

15 Concerning the manufacturing of suitcases and/or briefcases and/or spectacle-cases or the like, as well as of other natural leather goods, other applications have demonstrated the absolute reliability of the material according to the invention.

20 Furthermore, the material according to the invention may advantageously be applied to the production of chairs or sofas elements or structures.

25 According to a particular form of embodiment of the material according to the invention, the material itself is provided with a series of perforations or microperforations, which are usually carried out on the sheet or roll before the final cutting according to a predetermined shape or simultaneously to the embossing operation.

30 In this case the composite material has shown a particular effectiveness in being used as cork sole, since it allows a membrane made of unidirectional transparent material to be arranged between the cork sole and the sole of a footwear, thereby maintaining the foot always dry.

Moreover, the film provided with perforations can be coupled by means of hot-working with a material of the impermeable perspiring type, for instance Goretex® or Simpatex®.

- 5 A coupling of this type is particularly advantageous since it avoids the perspiring material to be joined to its carrier in a spot-like fashion, as it normally happens according to the known methods.

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CLAIMS

1. A composite material, comprising a supporting material in the form of sheet or roll constituted by one of the following materials:
 - 5 - cellulosic material, e.g. Bontex® or Texon®;
 - or a mixture of leather regenerated materials or derivatives thereof, e.g. Salpa®;
 - or natural leather;
 - or cork or wood;
 - 10 - or a coagulated material;
 - or felt;
 - or a perspiring material such as Goretex® or Simpatex®,characterised in that said supporting material is provided with an embossed covering surface layer consisting of a film in polyethylene or Surlyn®.
- 15 2. A composite material according to claim 1, characterized in that said supporting material is spread with a leather-like scent prior the embossing operation.
- 20 3. A composite material according to claim 1 or 2, characterized in that it is provided with a series of perforations or microperforations.
- 25 4. Use of a composite material, comprising a supporting material in the form of sheet or roll constituted by one of the following materials:
 - cellulosic material, e.g. Bontex® or Texon®;
 - or a mixture of leather regenerated materials or derivatives thereof, e.g. Salpa®;
 - 30 - or natural leather;
 - or cork or wood;
 - or a coagulated material;

- or felt;
- or a perspiring material such as Goretex® or Simpatex®,

5 and an embossed covering surface layer consisting of a film in polyethylene or Surlyn® for producing footwear cork soles and/or heels and/or vamps and/or toes, and/or suitcase elements spectacle-cases and/or brief-cases, and/or chairs or sofas elements or structures or furniture or furnishing elements.

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(54) Title: METHOD FOR PRODUCING A COMPOSITE MATERIAL AND MATERIAL OBTAINED BY MEANS OF SAID METHOD			
(57) Abstract A supporting material in the form of sheet or roll, constituted of a cellulosic material, or a rolled section in paper treated with a solution, or a rolled section in melaminic paper, or a mixture of leather regenerated materials or derivatives thereof, or cardboard or cardboard fiber, or needled fabrics, or synthetic or natural rubber, or foam made of reticulated polyethylene with closed cells, or foam made of reticulated polyethylene with closed cells, or natural or synthetic leather, or non-woven fabric, neoprene, masonite, recycled polyethylene, nylon, Lilion®, Tyvec®, polyester or a net made of synthetic material, or cork or wood, or a coagulated material, or felt, or foamed polyurethane, foamed polyethylene, foamed polystyrene, or a perspiring material, or an agglomerated stone-like material, is coupled to a covering layer made of polyethylene or Surlyn®, whereby the upper surface of the covering layer is embossed, in such a way as to imitate another material. This composite material has a high surface resistance, thus being particularly suitable for a plurality of applications; furthermore, said composite material is non-toxic and thus usable for contacting the skin for a long period of time.			

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**"METHOD FOR PRODUCING A COMPOSITE MATERIAL AND
MATERIAL OBTAINED BY MEANS OF SAID METHOD"**

TECHNICAL FIELD

5 The present invention relates to a method for producing a composite material.

More particularly, the present invention relates to a method for producing a material which is particularly suitable to be used in footwear manufacturing, specifically
10 for cork soles and/or vamps and/or toes production, as well as for other applications such as spectacle-cases or the like, panellings, suitcases or leather-goods, or chairs or sofas components.

Moreover, the invention relates to a material obtained
15 by using said method.

The invention is mainly applied in the fields of footwear industry or to the manufacturing of natural or synthetic leather or hides, as well as to the manufacturing of furnishing elements.

20 **BACKGROUND ART**

Footwear cork soles are usually obtained from sheet or roll supporting materials, which are generally constituted by cellulosic material or regenerated leather.

Said material represents the cork sole support, and a
25 mixture of résins together with a suitable dyestuff is sprayed or spreaded on one side of said material in a suitable industrial plant.

Thereafter, if necessary, the treated surface of the supporting sheets undergoes an embossing operation; finally,
30 said surface is then treated with a paint layer, usually a nitro paint.

Said manufacturing method, as well as the material obtained therewith, involves some disadvantages and

drawbacks, among which a low surface resistance of the treated layer, and relatively high production costs can be principally mentioned.

DESCRIPTION OF THE INVENTION

5 The present invention aims to give a simple and economic solution to the above-mentioned problems and, thus, to provide for a low-cost method for producing a composite material, said method being suitable for producing a material having a high surface resistance, thus being
10 particularly suitable for a plurality of applications, such as footwear cork soles or toes, and also parts of suitcases, brief-cases, spectacle-cases, chairs components or structures, etc., as well as for recycling and regenerating stocks of synthetic leather materials, said composite
15 material being non-toxic and thus usable for contacting the skin also for a long period of time.

This is obtained by means of a method having the features disclosed in the main claim.

The dependent claims describe particularly advantageous
20 forms of embodiment of the method according to the invention.

Furthermore, claim 9 discloses a composite material obtained by means of the method according to the present invention.

25 The method according to the present invention is carried out by providing a suitable supporting material available in sheets or rolls, with a polyethylene or Surlyn® covering layer, said layer being advantageously constituted by a thin film.

30 The coupling of said layer with the supporting material can be obtained with a cold-working, for instance interposing a suitable double adhesive film between the supporting material and the film made of polyethylene or

Surlyn[®], or by means of a sprayed or spread adhesive; alternatively, the coupling of the film can be obtained with a hot-working.

Moreover, the coupling between the supporting material
5 and the film made of polyethylene or Surlyn[®] can be obtained by interposing an intermediate layer between the supporting material and the covering film, said intermediate layer being constituted of, e.g.:

- 10 - either a rolled section in paper treated with a solution (for instance impregnated with resins of melaminic type or others), of the type generally used for the veneering and/or the lamination of furniture;
 - or a rolled section in inlaid wood;
 - or a multilayer film, for instance consisting of a layer
15 made of polyethylene, a layer made of aluminium or copper, a layer made of polyester and a layer made of polyethylene (or other combinations of said components);
 - or a film containing ferromagnetic elements;
 - or a film consisting of a layer made of polyvinyl
20 reactive acetate, a physic transfer film on polythene paper and a layer constituted by an UV or a polyurethan protection paint;
 - or a polyethylene/polypropylene film;
 - or a polipropylene or polyester film provided, when
25 necessary, with a barrier layer;
 - or a double adhesive polyethylene layer of the type "skin-pack";
 - or an insulating air cushion layer made of a synthetic material.
- 30 Said supporting material can be constituted by one of the following materials:
- either cellulosic material in sheets or rolls (for instance Bontex[®] or Texon[®]);

- or paper treated with a solution;
- or melaminic paper;
- or a mixture of leather regenerated materials or derivatives thereof (for instance Salpa);
- 5 - or cardboard or cardboard fiber;
- or needled fabrics (for instance of the type Orsa or Biagioli);
- or synthetic or natural rubber (latex, foam, Polilatex[®], foam rubber, Moltopren[®]);
- 10 - or foam made of reticulated polyethylene with closed cells;
- or leather, natural or synthetic leather, even from stock;
- or non-woven fabric, neoprene, masonite, ricycled
- 15 polyethylene, nylon, Lilion[®], Tyvec[®], polyester or a net made of synthetic material;
- or cork or wood;
- or coagulated materials;
- or felt;
- 20 - or foamed polyurethane, foamed polyethylene, foamed polystyrene,
- or an agglomerated stone-like material, preferably having a tile-like shape.

According to an essential feature of the invention, the

25 coupling operation of the polyethylene or Surlyn[®] covering layer to the supporting material is carried out simultaneously with an embossing operation of the polyethylene or Surlyn[®] upper surface.

The method according to the invention is extremely

30 advantageous since it allows, through the embossing operation, a coupled product to be obtained, which is characterised by a very high degree of similarity in respect

of the imitated material, which is non-toxic, and which at the same time has extraordinary mechanical properties, for instance a very high surface resistance to abrasion or scraping.

5 Furthermore, according to a form of embodiment, a wool layer or a net is placed over the covering layer.

According to a further form of embodiment, a latex foam supported by a suitable fabric or cloth can be placed between the supporting material and the superimposed
10 covering layer.

Besides, a dyestuff layer (physical or sublimatic) can be interposed between the supporting material and the transparent polyethylene or Surlyn® covering layer.

Following to the coupling operation, the resultant
15 composite material may immediately be cut so as to obtain the desired shapes, for instance cork soles or other footwear elements (heels or toes), or wall-paper sheets, suitcase elements, furniture articles, etc.

In this context, it is useful to remark that the
20 composite material according to the invention includes a polyethylene surface layer, which makes it non-toxic and it may freely be used in any applications which come into contact with the human skin, which operation is not possible, for instance, with known composite materials
25 having surface layers made of polyvinylchloride PVC.

A composite material obtained by means of the above-mentioned method has a very high surface resistance and can be used in many applications, above all in the footwear field.

30 In fact, tests demonstrated that this material is particularly suitable for manufacturing cork soles, which show higher mechanical resistance than those which are typical of the known cork soles, having a paint surface

layer; other interesting applications are those concerning the manufacturing of heels or toes or vamps.

In this context it is appropriate to note that, in the case where the supporting material is a leather, the application of the polyethylene surface layer gives stability to the supporting material surface, thereby preventing the formation of ashlars, concavities, etc.

According to a further form of embodiment of the invention, the supporting material can be sprayed with a leather-like scent prior to embossing. In this case the resulting material cannot be distinguished from real leather any more.

Concerning the manufacturing of suitcases and/or briefcases and/or spectacle-cases or the like, as well as of other natural or synthetic leather goods, other applications have demonstrated the absolute reliability of the material according to the invention.

Furthermore, the material according to the invention may advantageously be applied to the production of chairs or sofas elements or structures.

According to a particular form of embodiment of the material according to the invention, the material itself is provided with a series of perforations or microperforations, which are usually carried out on the sheet or roll before the final cutting according to a predetermined shape or simultaneously to the embossing operation.

In this case the composite material has shown a particular effectiveness in being used as cork sole, since it allows a membrane made of unidirectional transparent material to be arranged between the cork sole and the sole of a footwear, thereby maintaining the foot always dry.

Moreover, the film provided with perforations can be coupled by means of hot-working with a material of the

impermeable perspiring type, for instance Goretex® or Simpatex®.

A coupling of this type is particularly advantageous since it avoids the perspiring material to be joined to its carrier in a spot-like fashion, as it normally happens
5 according to the known methods.

CLAIMS

1. Method for producing a composite material, comprising a supporting material in the form of sheet or roll constituted by one of the following materials:
- 5 - cellulosic material, e.g. Bontex® or Texon®;
 - or a rolled section in paper treated with a solution;
 - or a rolled section in melaminic paper;
 - or a mixture of leather regenerated materials or derivatives thereof, e.g. Salpa;
 - 10 - or cardboard or cardboard fiber;
 - or needled fabrics, e.g. of the type "Orsa" or "Biagioli";
 - or synthetic or natural rubber, e.g. latex foam, Polilatex®, foam rubber, Multipren®;
 - 15 - or foam made of reticulated polyethylene with closed cells;
 - or natural or synthetic leather;
 - or non-woven fabric, neoprene, masonite, ricycled polyethylene, nylon, Lilion®, Tyvec®, polyester or a
 - 20 net made of synthetic material;
 - or cork or wood;
 - or a coagulated material;
 - or felt;
 - or foamed polyurethane, foamed polyethylene, foamed
 - 25 polystyrene,
 - or a perspiring material such as Goretex® or Simpatex®, or an agglomerated stone-like material, characterised in that a surface of said supporting material is coupled to a covering layer made of
 - 30 polyethylene or Surlyn®, and in that the upper surface of the coupled material is embossed, in such a way to imitate another material.

2. Method according to claim 1, characterized in that an intermediate layer is interposed between said supporting material and the surface covering layer, said intermediate layer being constituted by one of the following materials:
- a multilayer film or sandwich consisting of a layer of polyethylene, a layer of aluminium or copper, a layer of polyester and a layer of polyethylene variously arranged in the sandwich;
 - or a film containing ferromagnetic elements;
 - or a film consisting of a layer of polyvinyl reactive acetate, a physic transfer film on polythene paper and a layer of UV or polyurethan protection paint;
 - or a polyethylene/polypropylene composite film;
 - or a polipropylene double adhesive film of the "skin-pack" type,
 - or a latex foam layer coupled with a fabric or cloth;
 - or an insulating air cushion layer made of a synthetic material.
3. Method according to claim 2, in which the supporting material is either constituted by cellulosic material, or regenerated leather or needled materials, characterized in that said intermediate layer is either constituted by a paper treated with a solution or by a thin inlaid woodlayer.
4. Method according to anyone of claims 1 to 3, characterized in that the coupling operation is carried out by means of a cold-working or of a hot-working through a suitable bonding agent.
5. Method according to claim 1, characterized in that said rolled section in paper treated with a solution or in melaminic paper includes a thermoadhesive element in its composition.

6. Method according to any of the preceding claims, characterized in that the embossing operation is carried out during or immediately after the coupling of the covering layer with the supporting material.
- 5 7. Method according to any of the preceding claims, characterized in that said covering layer is provided with microperforations on its surface.
8. Method according to claim 1, characterized in that a physical or sublimatic dyestuff layer is interposed
10 between the supporting material and the covering layer.
9. Composite material, comprising a supporting material in sheet or roll constituted of one of the following materials:
- cellulosic material, for instance Bontex® or Texon®;
 - 15 - or a rolled section in paper treated with a solution;
 - or a rolled section in melaminic paper;
 - or a mixture of leather regenerated materials or derivatives thereof, for instance Salpa;
 - or cardboard or cardboard fiber;
 - 20 - or needleful fabrics, for instance of the type "Orsa" or "Biagioli";
 - or synthetic or natural rubber, e.g. latex foam, Polilatex®, foam rubber, Multipren®);
 - or foam of reticulated polyethylene with closed
25 cells;
 - or leather, natural or synthetic leather, even from stock;
 - or fabric-non-fabric, neoprene, masonite, recycled polyethylene, nylon, Lilion®, Tyvec®, polyester or a
30 net made of synthetic material;
 - or cork or wood;
 - or coagulated materials;

- or felt;
 - or foamed polyurethane, foamed polyethylene, foamed polystyrene,
 - or a perspiring material such as Goretex® or Simpatex®,
 - or an agglomerated stone-like material,
- said supporting material being provided with an embossed covering surface layer consisting of a film in polyethylene or Surlyn®,
- characterized in that it is obtained by means of a method according to anyone of the preceding claims.
10. Use of a material according to claim 9 for producing footwear cork soles and/or heels and/or vamps and/or toes, and/or suitcase elements and/or elements in artificial leather such as for instance spectacle-cases and/or brief-cases, and/or chairs or sofas elements or structures or furniture or furnishing elements.



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B32B 27/08, D06N 3/00, A43B 1/00	A3	(11) International Publication Number: WO 98/03333 (43) International Publication Date: 29 January 1998 (29.01.98)
(21) International Application Number: PCT/IT97/00130 (22) International Filing Date: 10 June 1997 (10.06.97) (30) Priority Data: VR96A000067 19 July 1996 (19.07.96) IT (71)(72) Applicant and Inventor: VALENTE, Gabriele [IT/IT]; Via Sirtori, 7, I-37128 Verona (IT). (72) Inventor; and (75) Inventor/Applicant (for US only): LAMACCHI, Alberto [IT/IT]; Via del Lavoro, 36/b, I-37066 Sommacampagna (IT). (74) Agent: SANDRI, Sandro; Europatent s.a.s., Via Locatelli, 20, I-37122 Verona (IT).		(81) Designated States: AL, AU, BA, BB, BG, BR, CA, CN, CU, CZ, EE, GE, HU, IL, IS, JP, KP, KR, LC, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, US, UZ, VN, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 19 March 1998 (19.03.98)
(54) Title: METHOD FOR PRODUCING A COMPOSITE MATERIAL AND MATERIAL OBTAINED BY MEANS OF SAID METHOD		
(57) Abstract <p>A supporting material in the form of sheet or roll, constituted of a cellulosic material, or a rolled section in paper treated with a solution, or a rolled section in melaminic paper, or a mixture of leather regenerated materials or derivatives thereof, or cardboard or cardboard fiber, or needled fabrics, or synthetic or natural rubber, or foam made of reticulated polyethylene with closed cells, or foam made of reticulated polyethylene with closed celle, or natural or synthetic leather, or non-woven fabric, neoprene, masonite, recycled polyethylene, nylon, Lilion®, Tyvec®, polyester or a net made of synthetic material, or cork or wood, or a coagulated material, or felt, or foamed polyurethane, foamed polyethylene, foamed polystyrene, or a perspiring material, or an agglomerated stone-like material, is coupled to a covering layer made of polyethylene or Surlyn®, whereby the upper surface of the covering layer is embossed, in such a way as to imitate another material. This composite material has a high surface resistance, thus being particularly suitable for a plurality of applications; furthermore, said composite material is non-toxic and thus usable for contacting the skin for a long period of time.</p>		

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 97/00130

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3892078 A		JP 49124185 A	27-11-74

EP 0163045 A	04-12-85	DE 3420121 A	05-12-85
		DE 3422783 A	02-01-86
		DE 3431474 A	06-03-86
		DE 3439727 A	30-04-86
		CA 1267352 A	03-04-90
		EP 0163133 A	04-12-85
		JP 61008048 A	14-01-86
		US 4887368 A	19-12-89

DE 8431869 U	27-02-86	NONE	

GB 1481876 A	03-08-77	US 3895153 A	15-07-75
		AU 467758 B	11-12-75
		AU 7402274 A	11-12-75
		DE 2447989 A	24-04-75
		JP 869353 C	13-07-77
		JP 50065536 A	03-06-75
		JP 51044010 B	26-11-76

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 97/00130

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3799827 A	26-03-74	NONE	
FR 2379387 A	01-09-78	NONE	
DE 2226645 A	14-12-72	BE 784288 A	02-10-72
		FR 2140155 A	12-01-73
		NL 7207251 A	05-12-72
		US 3741844 A	26-06-73
		ZA 7203152 A	28-02-73
FR 2700497 A	22-07-94	NONE	
WO 9627497 A	12-09-96	DE 19508158 A	12-09-96
		AU 5102796 A	23-09-96
		EP 0813474 A	29-12-97
FR 2227125 A	22-11-74	CH 575508 A	14-05-76
		DE 2419324 A	07-11-74
		SE 435850 B	22-10-84
EP 0374930 A	27-06-90	JP 2269098 A	02-11-90
		JP 2167746 A	28-06-90
		JP 7002414 B	18-01-95
		AU 640630 B	02-09-93
		AU 4992590 A	11-10-90
		CA 2006007 A	21-06-90
		US 5188395 A	23-02-93
		CN 1044068 A	25-07-90
US 3804700 A	16-04-74	US RE28682 E	13-01-76
GB 1549421 A	08-08-79	AU 1291976 A	20-10-77
		BE 840550 A	11-10-76
		DE 2616067 A	28-10-76
		FR 2306831 A	05-11-76
		JP 51133378 A	19-11-76
		NL 7603824 A	12-10-76
		SE 7604243 A	11-10-76
US 3892078 A	01-07-75	DE 2341747 A	07-03-74

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 97/00130

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1514224 A	14-06-78	CS 187323 B DE 2528947 A JP 999700 C JP 51006286 A JP 54034043 B	31-01-79 22-01-76 30-05-80 19-01-76 24-10-79
DE 3220768 A	08-12-83	NONE	
DE 1654451 A	01-04-71	NONE	
GB 1536421 A	20-12-78	BE 837090 A DE 2558920 A FR 2297136 A JP 51092357 A NL 7600006 A	16-04-76 08-07-76 06-08-76 13-08-76 09-07-76
FR 2388659 A	24-11-78	DE 2721532 A BE 866294 A	09-11-78 24-10-78
US 3849174 A	19-11-74	AU 472670 B AU 5235173 A BE 795862 A CA 1013624 A DE 2309059 A FR 2173257 A GB 1426077 A JP 872175 C JP 48099258 A JP 52001750 B US 3874833 A BE 752972 A CH 527683 A DE 2065797 A DE 2033156 A FR 2054186 A GB 1322535 A US 3658978 A US 3765817 A	03-06-76 22-08-74 23-08-73 12-07-77 30-08-73 05-10-73 25-02-76 20-07-77 15-12-73 18-01-77 01-04-75 04-01-71 15-09-72 05-02-76 21-01-71 16-04-71 04-07-73 25-04-72 16-10-73
GB 1466030 A	02-03-77	JP 51003222 A	12-01-76

INTERNATIONAL SEARCH REPORT

International Application No. PCT/ IT 97/00130

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims : 1-10(partially) A method and product characterised in that the supporting material is selected from (i) cellulosic material, (ii) a rolled section in paper treated with solution, (iii) a rolled section in melaminic paper.

A method and product characterised in that the supporting material is selected from synthetic or natural rubber, whereby once again this definition is rather vague; having regard to the examples it is assumed that foamed materials are meant, (i) foam made of reticulated polyethylene with closed cells, (ii) foamed polyurethane, (iii) foamed polyethylene, (iv) foamed polystyrene.

2. Claims : 1-10(partially) A method and product characterised in that the supporting material is selected from (i) a mixture of leather regenerated materials or derivatives thereof, (ii) natural or synthetic leather.

3. Claims : 1-10(partially) A method and product characterised in that the supporting material is selected from a cardboard or cardboard fibre.

4. Claims : 1-10(partially) A method and product characterised in that the supporting material is selected from (i) needed fabrics, (ii) nonwoven fabric, neoprene, masonite, recycled polyethylene, nylon, Lilon (TM), Tyvec (TM), polyester or a net made of synthetic material, whereby it is noted that the definition of these supporting materials is not quite clear and that it is assumed that nonwoven fibrous materials are meant, (iii) a felt.

5. Claims : 1-10(partially) A method and product characterised in that the supporting material is selected from cork or wood,

6. Claims : 1-10(partially) A method and product characterised in that the supporting material is a coagulated material.

7. Claims : 1-10(partially) A method and product characterised in that the supporting material is a perspiring material.

8. Claims : 1-10(partially) A method and product characterised in that the supporting material is an agglomerated stone-like material.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IT 97/ 00130

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please see enclosed sheet for more information!

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☒ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IT 97/00130

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 804 700 A (HOEY C) 16 April 1974 see column 4, line 18 - line 28 see column 5, line 7 - line 51; claims ---	1,6,9
X	GB 1 549 421 A (SCOTT PAPER CO) 8 August 1979 see claims; figures ---	1,9
A	US 3 892 078 A (CLOSSON JR ADDISON W) 1 July 1975 see claims; figures ---	1,9,10
A	EP 0 163 045 A (INDENTOR AG) 4 December 1985 see claims ---	1,9,10
A	DE 84 31 869 U (INDENTOR AG, BUCHS, CH) 27 February 1986 see claims; figure ---	1,9,10
A	GB 1 481 876 A (MINNESOTA MINING & MFG) 3 August 1977 see claims; figures -----	1,9

INTERNATIONAL SEARCH REPORT

Intern: al Application No
PCT/IT 97/00130

C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 536 421 A (ICI LTD) 20 December 1978 see page 2, line 20 - line 43; claims ---	1,6,9,10
X	FR 2 388 659 A (BASF AG) 24 November 1978 see page 2, line 38 - page 3, line 6; claims ---	1,4,6,9, 10
X	US 3 849 174 A (ANCKER F) 19 November 1974 see column 9, line 7 - line 16; figures; example 1 ---	1,6,9
X	GB 1 466 030 A (FUJI PHOTO FILM CO LTD) 2 March 1977 see claims 1-8; example 1 ---	1,6,9
X	US 3 799 827 A (TAKIMOTO M ET AL) 26 March 1974 see column 2, line 22 - column 3, line 68; claims; figures ---	1,6,9
A	FR 2 379 387 A (FORMICA SA) 1 September 1978 see claims; example 3 ---	1,6,9
A	DR. H.D. JUNG: "Index of Polymer Trade Names 2nd, greatly enlarged edition" 1992, VCH VERLAGSGESELLSCHAFT MBH, WEINHEIM XP002040912 see page 550 - page 551 ---	
X	DE 22 26 645 A (TENNECO, CHEMICALS, INC., NEW YORK, N.Y.) 14 December 1972 see page 9, line 9 - line 12; claims 1,6,10 ---	1,6,9
X	FR 2 700 497 A (SILAC) 22 July 1994 see claims 1,2,7 ---	1,6,9
P,X	WO 96 27497 A (NABINGER UDO) 12 September 1996 see page 12, paragraph 3; claims 1,3 ---	1,6,9,10
X	FR 2 227 125 A (YHTYNEET PAPERITEHTAAT OY) 22 November 1974 see page 3, line 5 - page 4, line 40 see page 5, line 25 - line 34; claims 1,2,5; figure 4 ---	1,6,7,9
X	EP 0 374 930 A (GOYO PAPER WORKING CO LTD) 27 June 1990 see column 4, line 13 - line 24 see column 6, line 15 - line 20 see claims 1,4,6 ---	1,9

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IT 97/00130

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B32B27/08 D06N3/00 A43B1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B32B D06N A43B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 514 224 A (ROHM & HAAS) 14 June 1978 see page 1, line 12 - line 40 see page 5, line 86 - page 6, line 11; claims 1,2,6,12-14 ---	1,6,9,10
X	DE 32 20 768 A (PELZ ERNST) 8 December 1983 see page 3, line 1 - page 4, line 9 see page 6, paragraph 2 see page 7, paragraph 5 see page 11, paragraph 6 see claims 1-4,6,7 ---	1,6,7,9,10
X	DE 16 54 451 A (KÖBA-AUSRÜSTUNGS-GMBH) 1 April 1971 see the whole document ---	1,6,9,10
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

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- *Z* document member of the same patent family

Date of the actual completion of the international search

14 January 1998

Date of mailing of the international search report

05.02.98

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